

THE POPPY SEED DEFENSE

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OVERVIEW

- The Opium Poppy
- Heroin Metabolism
- Poppy Seed Manufacturing
- Poppy Seed Morphine Levels
- Immunoassay Drug Tests
- Testing for Heroin Metabolites
- Notable Cases of Poppy Seed Poisoning

THE OPIUM POPPY



FROM HARMLESS FLOWER TO HEROIN



Petals fall away revealing
a ripening pod the
size of an egg

Contains over 50 types of
alkaloids



12 weeks later...
Small incisions made
and milky sap released



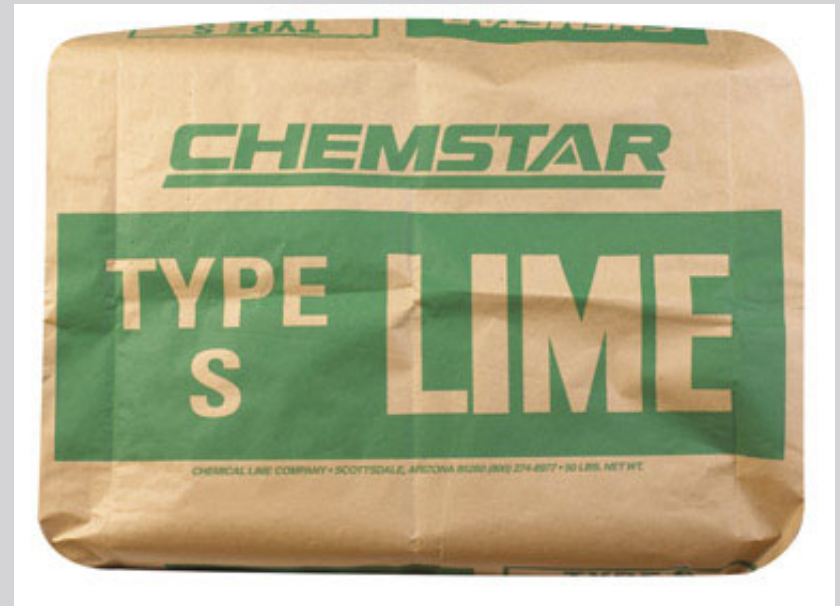
Brown oxidized resin is
collected

FROM HARMLESS FLOWER TO HEROIN



Raw opium is dissolved in boiling water

Impurities float to the top and are removed



Slacked lime is added.
Morphine reacts with lime.

Solution is filtered to remove other alkaloids.

FROM HARMLESS FLOWER TO HEROIN



Ammonia and heat added



Result: morphine base (heroin no.1)



Dissolved in acetic acid for 2 hours

Morphine will solidify at the bottom

Upon cooling, morphine and acetic acid form heroin

FROM HARMLESS FLOWER TO HEROIN



Addition of sodium carbonate
and filtration

Result: heroin base (heroin no.2)



Addition of hydrochloric acid
Dried from paste to powder

Result: smoking heroin (heroin no.3)

FROM HARMLESS FLOWER TO HEROIN

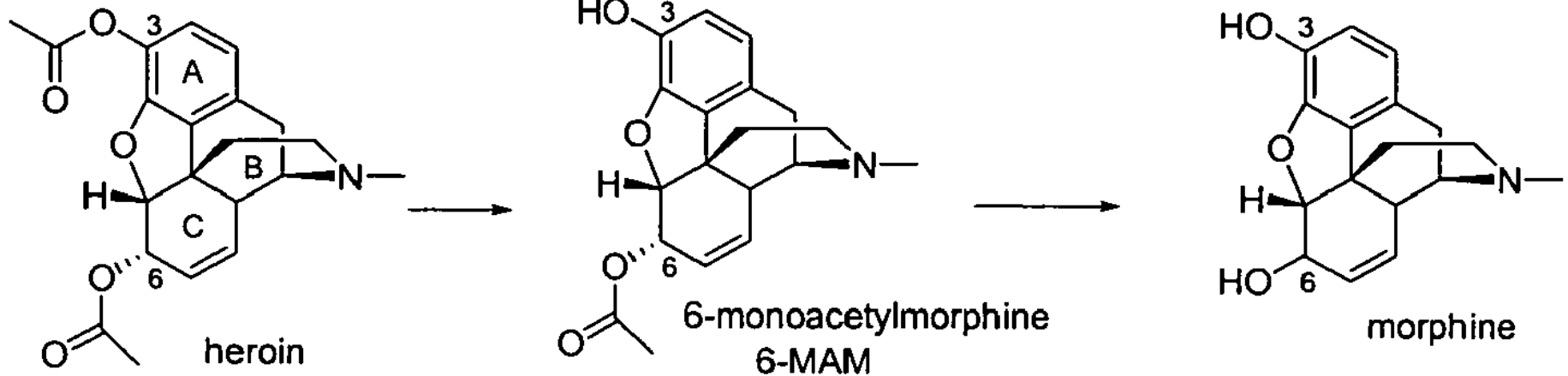


Addition of hydrochloric acid and
ether

Dried from paste to powder

Result: injection heroin (heroin no.4)

HEROIN METABOLISM



HARVESTING POPPY SEEDS

- 1. Stems and bulbs brown and brittle
- 2. Stems cut and placed in paper bag
- 4. Let set 3 weeks
- 5. Break pods to release seeds
- 6. Make delicious baked goods



MORPHINE CONTENT OF SEEDS

■ Origin of seeds

Country of Origin	Morphine Content ($\mu\text{g/g}$)
Australia	200
India	167
Germany	151.6
Spain	60
Poland	12
Denmark	8.4
Hungary	6.9
Turkey	0.8

MORPHINE CONTENT OF SEEDS

- Treatment of seeds

Treatment of Seed	Morphine Reduction
Washing/soaking in water	40% - 73%
Grinding	25% - 34%
Baking	30% - 90%
Commercial manufacture	~100%

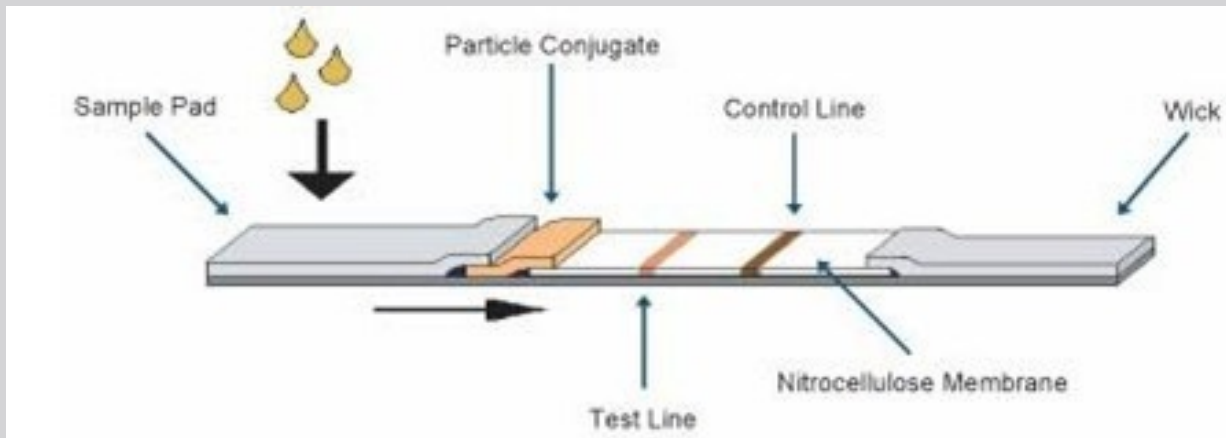
MORPHINE CONTENT OF SEEDS

- Harvesting technique
 - Timing
 - Contamination
 - Treatment of seeds during/post harvest



IMMUNOASSAY DRUG TESTS

- Specific anti-drug antibody
- Add patient's urine
- If drug present: anti-drug antibody binds to drug—positive band appears
- If drug absent: anti-drug antibody doesn't bind to drug—no band appears



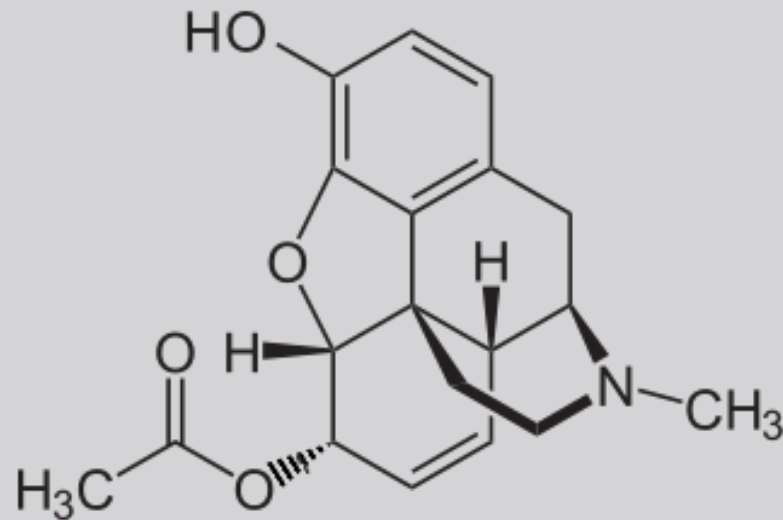
DRUG TEST FOR OPIATES

- Analyte of interest: morphine
- Opiate cut off: 300 ng/mL
- Time detected after use: 48-72 hours



OTHER SIGNS OF ILLICIT HEROIN USE

- 6-MAM half life: 2 hours
- Codeine
- Acetylcodeine
- Morphine : Codeine ratio



POPPY SEED OVERDOSE

- 6 month old
- Strained poppy seed milk
- Child's symptoms
 - Breathing disturbances
 - Unconsciousness
 - No reactions to pain stimulus
- Child given opiate antidote (naloxone)
- The milk
 - 75 mL strained milk
 - 200 g poppy seeds
 - Ingested dose: 30 mg morphine



POPPY SEED OVERDOSE

- Adult
- Pasta dish containing ~75 g poppy seeds
- Symptoms:
 - “dim feelings in the head”
 - Vomiting
 - Hangover-like feelings
- Ingested dose: 16 mg morphine



FULL DOSE FROM POPPY SEEDS?

- Normal oral dose of morphine: 30 mg
- 30 mg morphine x 1 g poppy seeds = 39.84 g poppy seeds
0.251 mg morphine
- Seem like a lot?
- Most cake recipes call for over a cup of poppy seeds
 - That's over 128 grams of seeds!

CONCLUSIONS

- Due to the morphine content of poppy seeds, ingesting a minimal amount can lead to positive test results for illicit opiate use
- It is unlikely you will experience the effects of morphine unless you consume unwashed, raw poppy seeds
- PLEASE DON'T TRY THIS AT HOME

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QUESTIONS?

